



Docket No. P/50609/Marks

PATENT APPLICATION**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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July 7, 2003
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In re: Application of : Nicholas P. COWLEY

Serial No. : 09/658,745 Group Art Unit: 2683

Filed : September 11, 2000 Examiner: M. Torres

For : FREQUENCY CONVERTER AND RADIO FREQUENCY TUNER

New York, New York
July 7, 2003

REQUEST FOR RECONSIDERATION

Hon. Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

In response to the Official Action dated April 11, 2003, reconsideration of this application is respectfully requested.

The Examiner cites the combination of Tumeo and Roth as rendering obvious the invention defined in independent claims 1 and 9. The Examiner comments that Tumeo has all of

the features of claim 1 except the variable divider. The Examiner alleges that Roth discloses this feature.

Roth discloses a frequency converter arrangement of dual conversion type in which cascaded mixers receive local oscillator signals from two local oscillators. The first local oscillator is controlled by a phase locked loop whereas the second local oscillator is crystal controlled. The signals from the local oscillators are supplied to a mixer which forms the difference frequency between the frequencies of the local oscillators and supplies this to a fractional N-frequency divider. The divided frequency difference is supplied to a phase detector forming part of a phase locked loop which controls the frequency of the first local oscillator.

Claims 1 and 9 of the present application require that the variable divider receives the variable frequency signal from the variable frequency oscillator and divides this by any selected one of a plurality of integers, each of which is greater than one. The resulting signal is then supplied to the mixer of the frequency converter. There are several significant differences between this and the disclosure of Roth. First of all, the variable divider in Roth does not receive a variable frequency signal from any local oscillator but, instead, receives a frequency difference signal. Further, the output of the variable divider in Roth is not supplied to a mixer, as required by the present invention, but instead is supplied to a phase detector of a phase locked loop. Further, the variable divider of Roth is a "fractional N-frequency divider" whereas the variable divider of the present invention is not. In particular, the divider of Roth is used to divide by non-integer numbers whereas the variable divider of the present invention is specifically required to divide by integers greater than one.

Applicant further notes that the variable divider of Roth is used for an entirely different purpose from that of the present invention. In particular, the variable divider of Roth is used within a phase locked loop and is explicitly not concerned with dividing the output of a local oscillator. The variable divider of the present invention explicitly divides the frequency of the local

oscillator by different integers greater than one. The smallest possible division ratio is therefore two and the other division ratios are greater than this. The variable divider is effectively acting as a band switch and ensures that the frequency of the local oscillator is always outside the received signal band (see final paragraph of page 6 of the instant specification). A substantial advantage of this is that no local oscillator reject filter is required so that it is completely unnecessary to provide a tracking filter of this type. Roth is concerned with entirely different matters.

The Examiner also refers to the admitted prior art. Applicant assumes that the Examiner is referring to United Kingdom Patent No. 2 188 804. This document discloses a band switching arrangement, but this arrangement allows the divider to be effectively switched out of circuit so that the local oscillator signal is supplied direct to the associated mixer for one setting of the band switching. This results in the local oscillator frequency being inside the received signal band and therefore requires a tracking local oscillator reject filter in order to prevent re-radiation from the input. As mentioned above, the present invention completely removes the need for such a tracking filter.

Combining the teachings of Tumeo and Roth would result in a frequency converter having an image reject mixer, a local oscillator and a phase locked loop including a fractional N-frequency divider. Such a combination fails to disclose the use of a variable divider for dividing the local oscillator frequency supplied to the mixer by integers greater than one. Combining Tumeo with United Kingdom Patent No. 2 188 804 would result in a frequency converter having an image reject mixer and a local oscillator supplying the mixer via an arrangement which passes the local oscillator signal without changing frequency to the mixer or divides the frequency by integers greater than one. This combination would fail to disclose a variable divider which always divides the

frequency of the local oscillator signal supplied to the mixer by an integer greater than one so that the local oscillator frequency would always be outside the received signal band.

Thus, both of the combinations mentioned or implied by the Examiner would fail to teach all of the features of either claim 1 or claim 9. Further, both such combinations would still require the presence of a tracking local oscillator reject filter. The present invention is therefore clearly novel with respect to both combinations and achieves the substantial advantage of not requiring a tracking local oscillator reject filter.

Given that the two independent claims are patentable, it is not necessary to comment on any of the objections raised by the Examiner to the dependent claims.

With regard to the objection to the drawings, enclosed, for the Examiner's approval, is a marked-in-red copy of Figs. 1 and 2 bearing the legend "*Prior Art*".

Wherefore, a favorable action is earnestly solicited.

Respectfully submitted,

KIRSCHSTEIN, OTTINGER, ISRAEL & SCHIFFMILLER, P.C.

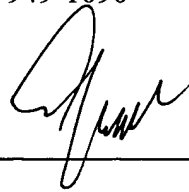
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